# Brainstorm: High Reliability

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**Brainstorm**: With the advent of wireless equipment designs being challenged for high reliability demands, what connectivity considerations must be taken?

Today’s process infrastructure requires practices and equipment that keep operations functioning regardless of environmental conditions or other potentially harmful disturbances. During development of wireless equipment for automating and monitoring these processes, high reliability design and development practices are paramount.

With enclosure design, connectivity is a topic of major consideration. Several often opposing considerations must be weighed when integrating connectivity into a design. In any application where high reliability is a requirement, durability of the connection must be carefully scrutinized.

Considerations for installation cases and customer experience must also play a decisive role. Wired connections must maintain ruggedized durability in all configurations, regardless of connection style. Many connection styles commonly used in wireless equipment are not sufficient to meet the demands of outdoor high reliability products. With regards to connections for wireless signal, two design styles must be examined.

The first approach is to integrate the antenna completely into the enclosure. This approach can lead to good signal control, small antenna size, and aesthetic appeal.

The second approach is to allow for a removable aerial element. This feature necessitates the integration of RF connectors into the enclosure design. This approach, while challenging in several aspects, allows for superior flexibility and signal control for the integration team. Many wireless applications are improved by extending the reach of the physical antenna via a cable. Additionally, antenna characteristics can be selected to best fit various applications.

Regardless of connection style employed in the design of these wireless devices, high reliability design must be balanced with considerations for the ease of use of the customer. The task as a designer is challenging, but also ripe with opportunity for innovation.

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